ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

1984
KOTZEBUE DISTRICT
SALMON REPORT

to the

ALASKA BOARD OF FISHERIES
NOVEMBER 1984

Kotzebue District Office: P.O. Box 686, Kotzebue, Alaska 99572

Area Management Biologist - Leonard Schwarz
Assistant Management Biologist - Joe Dinnocenzo
Project Biologist - Brian Bigler

I. TABLE OF CONTENTS

II. BACKGROUND

A. District Boundaries and Legal Gear

The Kotzebue District includes all waters from Cape Prince of Wales north to Point Hope. All commercial fishing effort occurs in marine waters near the village of Kotzebue (Figure 1). Commercial fishermen can legally operate set gillnets of up to 150 fathoms. Open skiffs powered by outboard motors are used to operate the fishing gear and deliver the fish to buyers.

B. Management Objectives and Strategies

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the Kotzebue area. The main objective of the Department's program is to manage both fisheries on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, including assignment of subsistence as the highest priority among beneficial uses of the resource.

Department tagging studies have indicated that the bulk of the chum salmon returning to the Kotzebue District are bound for the Kobuk and Noatak Rivers. Consequently, commercial fishing is limited to an area near Kotzebue to prevent establishment of a cape fishery which would intercept salmon bound for other streams.

The majority of the Kobuk River run occurs in the commercial fishery during July, while the Noatak River run is dominant during August. Since the Kobuk River run is less abundant and sustains greater subsistence harvest, the July commercial fishery is generally restricted to two 24 hour periods a week. Fishing time is usually increased to at least two 36 hour periods a week in August. Further adjustments in fishing time are often made based on comparative catch and escapement data which are indicative of run strength.

Escapement data is obtained through aerial surveys of all major spawning areas. A newly designed sonar was tested in the lower Noatak in an effort to obtain both inseason and total escapement estimates.

The commercial fishing season closes by regulation on August 31 when the chum run has substantially decreased and the

arctic char run is beginning. There is no closed season, closed periods or harvest limits for subsistence salmon fishing except that commercial fishermen, during the commercial fishing season, may only subsistence fish during open commercial periods.

C. Status of Fishery and Stocks

Chum salmon is the target species for both the commercial and subsistence salmon fisheries. Although a noticeable increase of pink salmon has occurred over the last several years, over 99% of the total salmon harvest is comprised of chum salmon. King, red and coho salmon occur in small numbers.

There was an early commercial salmon fishery during 1914-1918 and the recent fishery has occurred each year since 1962. Chum salmon harvests averaged about 85,000 fish during 1962-1972, but harvests increased to an average of 350,000 during 1973-1984 (Table 1). Chum salmon harvests during the last 10 years have fluctuated widely (from 111,000 to 677,000) which can be expected from a population which inhabits the northern extreme of the species range. Fishing effort increased drastically during the 1973-1975 period and has since stablized at about 180-190 fishermen (Table 2).

Subsistence harvests have been documented by the Department since 1962 and have ranged from 10,000 to 70,000 chum salmon. These harvest figures are considered minimum estimates since not all fishermen are contacted during household surveys. During the first 10 years of surveys (1962-1971) the average documented catch was 34,000 with an average catch per fisherman of 354 chum. During the next 10 years (1972-1981), the average documented subsistence catch dropped to 17,000 fish with the average catch per fisherman dropping to 183 chum even though the five largest runs on record occurred during this time. These data indicated that subsistence use of chum salmon had declined over this 10 year period (Table 1). Due to budgetary constraints only limited subsistence catch data was obtained in 1983 and 1984 which is not comparable to past data.

Aerial surveys have been used to document escapements since 1962. When standardized methods are used and surveys are flown under fair to good weather and stream conditions, the resultant data is comparable from year to year and can be used to measure performance of the fishing management

program. Over the past decade, escapements have gone from record levels (1973-1975), to very low levels (1976-1979), and back to record levels (1980-1982) (Table 2). The 1983 and 1984 escapements were about average. Chum salmon escapements of 80,000 in the Noatak River and 20,000 in the Squirrel, Salmon, and Tutsuksuk tributaries of the lower Kobuk River, as documented under fair to good aerial survey conditions are considered to be average.

III. SEASON SUMMARY

A. Commercial Fishery

Kotzebue commercial salmon fishermen harvested 320,206 chum during the 1984 season. This was very close to the 10 year average catch (Table 1). According to the Commercial Fisheries Entry Commission, there is a total of 222 salmon permits in existence in this district. A total of 181 fishermen actually made landings during the 1984 fishery, which is 5 less than the recent 5 year average.

Commercial fishermen earned approximately $1,150,000 for this season's catch, excluding bonuses. This was the sixth most valuable catch on record. The average fisherman sold $6,347 worth of fish. The average price per pound for chum salmon was $.44 per pound with an average weight of 8.2 pounds per fish (Table 3).

Prior to the season the Department forecasted a return of 248,000 chum salmon with a commercial harvest of 28,000. Since this return would have been one of the lowest on record, many commercial fishermen were concerned about how the fishery would be managed. As a result the staff held several public meetings, issued several news releases, and were interviewed by the local radio station regarding this issue. The staff stated that management decisions would not be based on the actual forecast, however if inseason run strength indicators showed a poor return was in progress then fishing time would be restricted so that escapement goals could be met. An actual return of over 400,000 chum salmon occurred, making severe restriction of fishing time unnecessary.

The commercial fishery opens by regulation on July 10, but to allow for the normal scheduling of commercial fishing periods and the collection of comparable catch statistics, the first period of the 1984 season was opened on Monday July 11. Commercial fishing periods consisted of two

24-hour periods a week until July 30 when fishing time was increased to two 36-hour periods a week based on comparative catch and escapement index data which indicated a strong Noatak run. Extremely poor weather and fishing conditions during the first 36 hour fishing period resulted in low fishing effort and a small harvest. The next fishing period which started on August 4 was extended to 48 hours to compensate the fleet for lost fishing time due to poor weather. After this fishing period, comparative catch and escapement statistics continued to indicate that the Noatak River chum run was above average in strength and fishing time was extended to two 48 hour periods per week starting August 6. Beginning on August 10, the chum salmon run began to decline, with the catches from the last two fishing periods substantially below average and the salmon run appeared to be largely over. This rapid decline in chum salmon abundance indicated that the run was not as large as earlier anticipated and to allow the remaining fish to escape to spawn the season was closed on August 23, eight days before the regulation season closure of August 31.

During the 1984 season a fleet survey was conducted by the staff in order to describe the present equipment and fishing methods used in the fishery. If fishing methods or equipment change substantially over time then catch statistics may not be comparable with past years and large catches may be due to increased efficiency and not large runs. Interviews were conducted with 15% of the fleet. The average fisherman was a Kotzebue resident using a 22 foot wooden boat with an outboard motor between 100 and 200 horsepower. The average net was 150 fathoms long, 29 meshes deep, with a mesh size of 5 7/8 inches. There are usually two crew members assisting and no hydraulic gear, radios or depth sounders on board.

B. Subsistence Fishery

During the last two years budgetary reductions have made it impossible to conduct complete village subsistence harvest surveys as was done from 1962 to 1982. As a result very little information on the subsistence salmon harvest in the Kotzebue District is available.

C. Escapement

Aerial surveys documented an upper Kobuk River escapement which was slightly above average (Table 2). The lower Kobuk River had less than one half the average escapement.

The Department tested a new sonar counter in the Noatak River for the first time in 1984. The results are preliminary and still being analyzed, however approximately 45,000 chum salmon were counted. If the sonar is found to accurately count chum salmon, management of the commercial fishery would become more precise. Having accurate inseason estimates of escapement would also help to achieve escapement goals.

In September, after the commercial fishery, salmon reach the clear upstream spawning grounds where they can be counted by aerial surveys. A survey on September 4 documented 68,000 chum salmon in the main Noatak River. Peak surveys of the Eli and Kelly Rivers (tributaries of the Noatak River) documented approximately 5,000 and 3,500 chum salmon respectively. Average escapement for the entire drainage is 86,500 chum salmon, so this year's escapement of 76,500 is slightly below average. The 1984 surveys were conducted under excellent conditions in early September while fish were still migrating upstream. Poor weather conditions did not allow surveys to be conducted in mid or late September. Had surveys been conducted later in September average escapement may have been documented.

V. Outlook for 1985

Forecast methods are based on the survivorship between the various age classes from total escapement to returning adults. The 1985 return is forcasted to be 421,300 chum salmon. Allowing for spawning escapement and subsistence harvests, a commercial catch of 271,300 salmon can be expected. A commercial catch of this size would be below the 5 year average of 390,000. The present forecast, which is dependent on a very limited past data base of questionable accuracy, is subject to substantial errors. This error should diminish over time as the forecast employs more and better data.

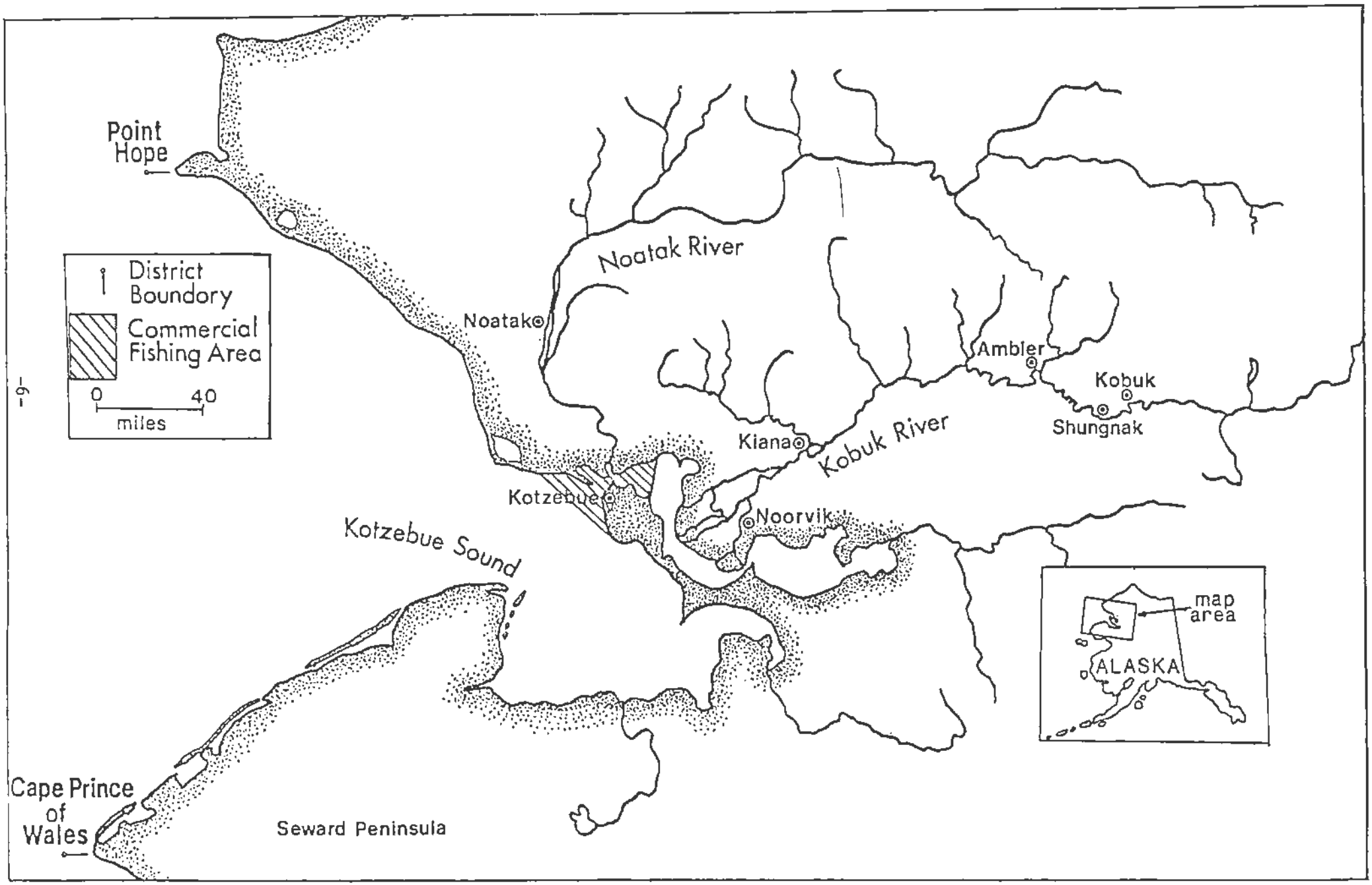

Figure 1. Kotzebue District.

Table 1. Commercial and Subsistence Salmon Catches, Kotzebue, 1914-1984.

	Commercial Catch			Subsistence Chum Catch			
Year 1/	Chum 2/	Other 3/	Total	Harvest	# fishermen interviewed	Avg. Catch Fishermen	Combined Catches
1914	8550	-	8550	-	-	-	-
1915	4750	-	4750	-	-	-	-
1916	19000	-	19000	-	-	-	-
1917	44612	-	44612	-	-	-	-
1918	27407	-	27407	-	-	-	-
1957	-	-	-	290430 4/	-	-	-
1962	129948	127	130075	70283	81	868	200358
1963	54445	143	54588	31069	67	464	85657
1964	76499	5	76504	29762	58	513	106266
1965	40034	-	40034	30500	89	343	70534
1966	30764	1	30765	35588	121	294	66353
1967	29400	-	29400	40108	135	297	69508
1968	30384 5/	-	30384	20814	65	126	51198
1969	59335	48	59383	29812	99	301	89195
1970	159664	-	159664	28486	164	174	188150
1971	154956	1	154957	23959	152	158	178916
1972	169664	3	169667	11085	96	115	180752
1973	375432	5	375437	18942	101	188	394379
1974	634479 6/	48	634527	26729	88	304	661256
1975	563682 7/	36	563718	27605	95	291	591323
1976	159796	2	159798	15765	91	173	175563
1977	195895	-	195895	9752	83	117	205647
1978	111533	7007	118540	12864	85	151	131404
1979	141623	910	142533	14605	97	151	157138
1980	367284	1654	386938	10945	111	98	379883
1981	677239	237	677476	17766	71	250	695242
1982	417790	57	417847	30133	204	148	447980
1983	175762	229	175991	8262 8/	46	180	184253
1984	320206	107	320313	- 9/	-	-	-
5 year avg.	355940	617					
10 year avg.	344508	1018					

1/ There was no commercial fishing during 1919-1961.
2/ Catches for 1914-1918 from pack data only; numbers of chums estimated at 9.5 per case (#48) and 34 per barrel.
3/ Mostly pinks, but includes chinook salmon and sockeye salmon.
4/ Estimated mean annual catches prior to 1957 (study by Raleigh).
5/ Corrected from 1968 annual report due to addition of late catches.
6/ Includes 6,567 chum salmon harvested from Deering expermental fishery.
7/ Includes 10,704 chum salmon harvested from Deering expermental fishery.
8/ Partial survey.
9/ No subsistence information available at time of report.

Table 2. Comparative Chum Salmon Catch, Effort, and Escapement Data, Kotzebue District, 1962-1984.

	Average 1962-74	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Commercial catch	149110 1/	553000 1/	159800	159900	111500	141600	367300	677200	417790	175762	320206
# Fishermen Fishing	79	224	220	224	208	181	176	187	199	189	181
Noatak River 2/ Escapement	67333	96500	44500	11000 5/	37500	19700	164500	166400	20682 5/	79773	67873
Lower 3/ Kobuk River Escapement	17200	43957	8390	1758 5/	2677	2238 5/	21992	14563	8930	7752	6944
Upper 4/ Kobuk River Escapement	10100	10702	2522	6/	1981	2008	11466	8648	14674	33746	10521

1/ Does not include data from Deering experimental fishery.
2/ Reflects aerial survey counts in the main Noatak River only.
3/ Reflects aerial survey counts in the Squirrel and Salmon Rivers, which are the major index tributaries to the Lower Kobuk River.
4/ Reflects aerial survey counts in the main Kobuk River above the village of Kobuk.
5/ Poor survey conditions or incomplete survey.
6/ Not surveyed.

Table 3. Dollar Value Estimates of Kotzebue District Commercial Fishery, 1962-1984.

Year	Gross Value of Catch to Fishermen 1/	Chum	
		Average Round Weight	Average Price
1962	$ 45,500.00	-	$ 0.35 4/
1963	9,140.00	-	0.35 4/
1964	34,660.00	8.3	0.45 4/
1965	18,000.00	9.0	0.45 4/
1966	25,000.00	10.1	0.11
1967	28,700.00	9.3	0.11
1968	46,000.00	9.7	0.14
1969	71,000.00	7.5	0.15
1970	186,000.00	8.1	0.15
1971	200,000.00	8.1	0.16
1972	260,000.00	9.1	0.17
1973	925,000.00	9.1	0.25
1974 2/	1,822,784.00	8.5	0.34
1975 3/	1,365,648.00	8.6	0.28
1976	580,375.00	8.9	0.41
1977	1,033,950.00	9.6	0.56
1978	575,260.00	9.1	0.57
1979	990,263.00	8.8	0.80
1980	1,446,633.00	8.6	0.46
1981	3,246,793.00	9.1	0.53
1982	1,961,518.00	9.3	0.51
1983	420,736.00	9.4	0.25
1984	1,148,884.00	8.2	0.44

1/ Some estimates between 1962 and 1981 include only chum value, which in all figures represents over 99% of the total value. Figures after 1981 represent the chum value as well as incidental species such as other species of salmon, char and whitefish.
2/ Includes $9,193 from the experimental commercial fishery at Deering.
3/ Includes $17,776 from the experimental commercial fishery at Deering.
4/ Price per fish.